TATD Operations Summary Highlights
For Activities conducted April 2018

TATD VEHICLE TESTING

- The number of vehicles that Certification brought in April for Compliance Testing was slightly above target and In-Use Testing was below the target. Combined they remain below the year-end target.
- Paired data FE offsets for the month of April consisted of 21% of FTP's and 36% of HWY's resulting in a FE offset > 3%.
    - Average offsets for the FTP were 0.4% and 0.8% for the HWY. The Manufacturer was lower on both.
- Total Vehicle tests were 296 tests.
- Enforcement/Investigatory / Ex. 7(a)
- ASD Running Loss Program: Testing in HTTF with a Chevrolet Volt, Toyota Prius and Hyundai Sonota.
- HEARO Program: Testing continued in D005 with a Mazda 3 and GM Silverado. CTTF cold testing with an Ford F150, and Acura ILX.
- Signature Device Testing: Testing on CTTF with a VW Jetta.

ENGINE TESTING SUPPORT – HEAVY Duty

HD01: HD1 ran 0.0hrs. in April NCAT removed the F150 and is deciding with ASD what they would like to test next.

HD02: Engine in cell: Cummins ISX 15L, Serial #79670202

- Total dyno run time for April 2018: 0 hours

HD3/MID ENGINE:

- HD03 ran the Kohler engine for a total of 8 hours
- Correlation testing on the ISB engine will begin at the start of May.

HD05: We rant the EMTC engine. It is a Cummins ISB260. This is our annual correlation program (7.8hrs). The months activities included:

- Continued work to check out the STARS upgrade.

NRSI:

- **Dyno 13**
  Honda EF: FHNXS.3892AZ Annual Repeatable engine test
  4 hours total
- **Dyno 14**
  0 hours total test

PEMS - PEMS Testing (15.58333333) 35 tests

PEMS testing the following test articles:

- 2016 Chevrolet Malibu Blue - 210014

CD/ASD/TCD	TATD/NCAT	LD GHG	Vehicle Testing Update
	X		**Robot driver system (**RDS): Began testing driver modules
	X		**Outboard testing:** Consulted with SWRI
X			**2015 Ram EcoDiesel:** In queue for testing
		X	**2014 Chevy Silverado:** Processing deac data for Tier 2 v. Tier 3
		X	**2017 Ford F150:** (ten speed transmission) Chassis testing complete. Doorlag analyzing data and preparing presentation to compare with 6 speed F150.
		X	**2018 Jeep Wrangler (48-volt BISG, 2.0L advanced turbo)**: SwRI preparing for acquisition and mileage accumulation of vehicle; expected completion May 18th.
	X		**2018 Cadillac CT6:** Putting together test plan for semi-autonomous features; scheduling SWRI and Jacobs support.
X			NCAT is continuing to coordinate the use of NCAT purchased test vehicles to support various programs: i. HEARO Support: Multiple vehicles on loan (Mazda 3, 2015 F150, Acura ILX, Silverado) ii. FCA Diesel Testing: Vehicle on loan (2014 Ram EcoDiesel) iii. PEMS Testing: Vehicle on loan (2017 F150, 2016 CX9) iv. UNECE Global Technical Regulation Development (2013 Malibu Eco, 2013 Volt)

CD/ASD/TCD	TATD/NCAT	LD GHG	Engine Testing
X		X	a. Toyota Camry engine and transmission benchmarking. Begin engine testing.
X		X	b. Toyota transmission benchmarking hardware design and fabrication. 50% complete.
X			c. Support ETC hand held (HH) dyno with chainsaw fixturing.
	X		d. Support outboard marine engine testing. Design and build test fixtures based on manufacturer's methods
X			e. Testing in HD2 with Cummins 15L to support HD NOx modeling.

CD/ASD/TCD	TATD/NCAT	LD GHG	Modeling
		X	Reverse engineering of Volpe CAFE model
	X	X	Began updating REVS platform for more detailed engine model to support HD NOx simulation
	X	X	Working on parallel computing update to avoid limitations due to number of licenses

CD/ASD/TCD	TATD/NCAT	LD GHG	Analysis and Other
X			**Enforcement/Investigatory / Ex. 7(a)**

Enforcement/Investigatory / Ex. 7(a)

X	X		TATD Data Warehouse meetings to understand needs and options IMC – Josh Young / ASD-MOVES – Darrell Sonntag / ETC / Attended Amazon Workshop to learn about tools and how OTAQ may utilize
X		X	Support ASD presentation to NAS

QUALITY

- **TEST PACKET AUDITS**
  - **Vehicle Testing**
    - Performed 48 Certification, 30 In-Use and 11 Certification special audits; above average audit quantity
    - 13 errors found by CDRT, 2 additional errors detected by QST; incorrect date on soak parameter form, 3% report not included in the test packet
  - **Engine Testing**
    - Performed 0 Heavy Duty Certification audits
    - 0 errors found by QST
- **VOID / VARIANT ANALYSIS**
  - **Vehicle Testing**
    - 11 voids / variants; 12% of compliance testing total, equal to average percentage
    - 1 Personnel void; dyno was not warmed up 2 hours before testing
    - 8 Equipment voids; driver's aid lost communication, PUMA crashed at the end of test, CH_4 span check failure (2x's), CH_4 drift check failure, 1066 dilution factor criteria not met, SHED analyzer went offline near end of test, diurnal test never started
    - 1 Equipment variant; NOx span check failure
    - 1 Project Officer void; CD deemed EPA RLD was unrepresentative compared to manufacturer dyno set coefficients
  - **Engine Testing**
    - 0 Heavy Duty void/variants
    - 0 Small Engine void/variants
- **CONCERNS, IMPROVEMENTS, NCWs & CORRECTIVE ACTIONS**
    - 1 new Corrective Action added for installing butane cylinder in canister load; 6 open; 0 closed
    - 0 new Non-Conforming Work items; 2 open; 1 closed
    - 7 Opportunities for Improvement and 0 Preventive Action currently open; 1 new OFI for calibrating decommissioned test equipment; 3 closed – 1 from ANAB reassessment audit
    - 0 new Customer Feedback items; 0 open; 0 closed
- **QUALITY MANAGEMENT SYSTEM**
    - 455 total approved and released documents, added 1 Vehicle testing and 1 Engine testing work instruction, obsoleted 3 Vehicle testing work instructions and 1 software process document; performed 36 document reviews; documents past the scheduled review due date decreased to 31
- **STAFF OBSERVATIONS**
    - Completed 10 staff observations; 1 new Vehicle testing work instruction, 1 new Engine testing work instruction and 8 Vehicle testing work instruction process revisions

- **ISO-17025 TEST METHOD VALIDATION STATUS**
  - Several sites indicate there has been progress made within specified steps of the process as indicated by the green “Moved Forward” and blue “Complete” indicators; HD03 - Mid Range Diesel finished the final step in the CFR checklist phase and is 100% complete, LD D329 - 1066 Upgrade completed one more step in the testing documentation phase

IMC

Office of Transportation and Air Quality
Testing and Advanced Technology Division
Information Management Center
April 2018

Service Availability

PMN Service Availability by Month

Service	Apr	Mar	Feb
DHCP Server *Controlled by OEI	100%	100%	100%
IP Network	100%	100%	99.94%
SAN Storage	100%	100%	100%
Storage Network	100%	100%	100%
VMWare Cluster	100%	98.50%	99.30%
Windows Servers	99.97%	99.99%	99.99%

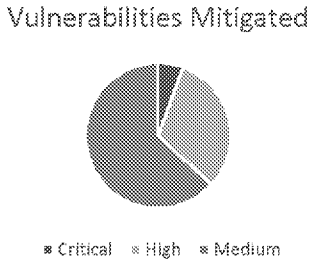
LNS Service Availability by Month

Service	Apr	Mar	Feb
Active Directory	100%	100%	100%
IP Network	100%	100%	99.90%
SAN Storage	100%	100%	100%
VMWare Cluster	100%	100%	100%
Windows Servers	99.99%	100%	100%
Oracle Services	100%	100%	100%

Information Security

Vulnerabilities Mitigated

Vulnerabilities	Low	Medium	High	Critical
April	77	226	112	20
March	89	193	145	48
February	56	254	162	27



Detected vulnerabilities are addressed on a continuous basis. Utilizing several risk mitigation and correction tools, IMC ensures the Confidentiality, Integrity, and Availability of all NVFEL data.

1 Security Event was reported in April: WiFi Access Point detected in LNS

IMC Key Achievements for April

- IMC completed the migration of all File Share data to the new, stable location. File shares are now hosted on the PMN IBM SAN, have received more resources, and have an increase in access speed.
- 2 more OEI funded access switches have been deployed to the lab building. The new switches are at the core of the PMN network and provide greater stability to an ever-increasing workload. One switch was placed in 306A, the other in 101B.
- Working with the IO, IMC has completed the 6 month technical process of moving OTAQ@Work into a modern hosting platform. The site now matches the agency standard of using Drupal Web Services, and has a much greater functionality than before.

IMC Planned Project Completion for May

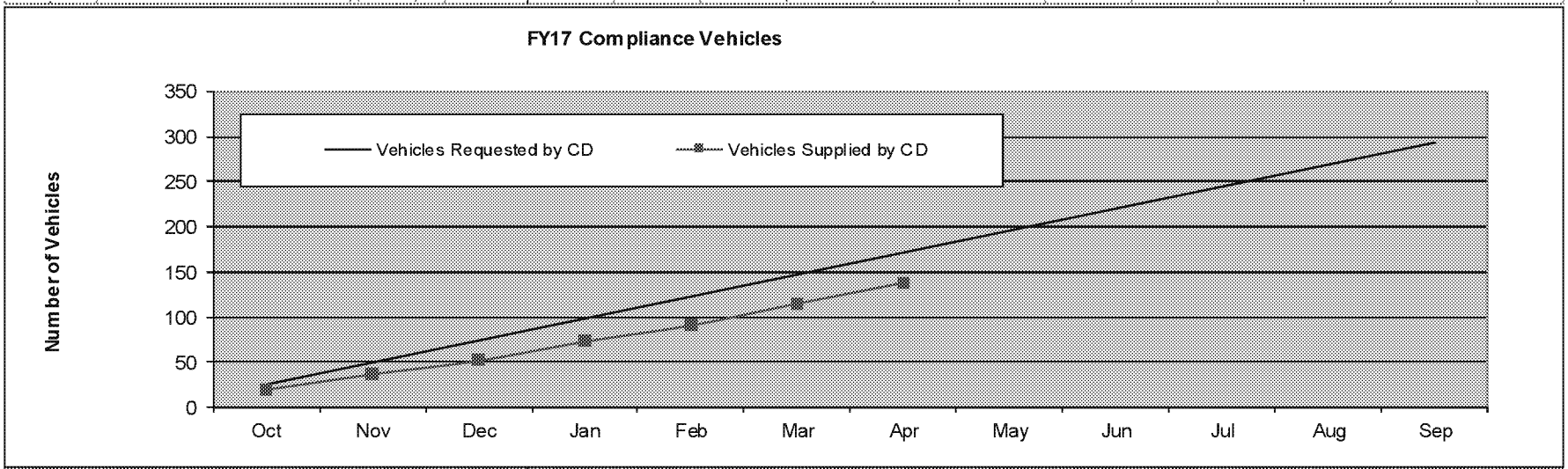
- TruView will be implemented into the LNS. Once operational, TruView will provide great insight into the traffic patterns as the communicate in the laboratory.
- IMC will implement a replacement for the LNS Time Server. The current time server has aged significantly, and has been approved for replacement.
- Working with partners in TSC, IMC will complete a LNS infrastructure diagram that displays the various technical assets through LNS. The diagram will give a greater insight into the current model for data flow throughout the lab.
- Incident Response training will be provided as part of the FY2 LNS System Assessment. A new Incident Response Plan has been created that will aid in lab security, as well as close out a medium finding from the FY2 assessment.

Overtime/Comptime

There was 1 hour comptime for the month of April.

NVFEL OPERATIONS METRICS – VTC/FCC TESTING

	units	Target	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
VEHICLE TESTING (Vehicle Count)														
Total Number of CD Vehicles	(count)	**294**	20	17	15	21	18	24	23					
Cumulative	(count)		20	37	52	73	91	115	138					
Annualized percent	(%)	100	82%	76%	71%	74%	74%	78%	80%					
Number of Cert Vehicles	(count)		9	7	9	13	10	13	14					
Cumulative	(count)	**150**	9	16	25	38	48	61	75					
Number of In-Use Vehicles	(count)		11	10	6	8	8	11	9					
Cumulative	(count)	**144**	11	21	27	35	43	54	63					



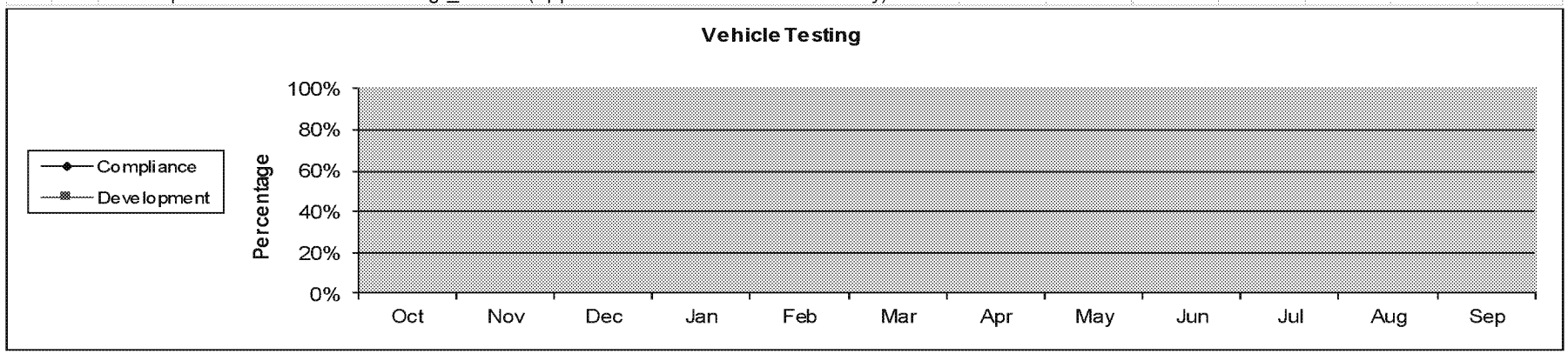
FUELS TESTING (Test Count)		**2000**												
Test fuel		500	30	20	28	18	0	10	18					
Correlations		1000	98	162	28	98	105	35	175					
All Other		500												
Audit			16						8					
Oversites			297	63	99	225	225	81	216					
Diesel Enforcement														
Bio-Diesel									14					
Gasoline Enforcement														
Exhaust (E-85) Samples Carbonyl Samples							10		6					
Exhaust (E-85) Samples Alcohol Samples									6					
Program Results						18	12	6	6					

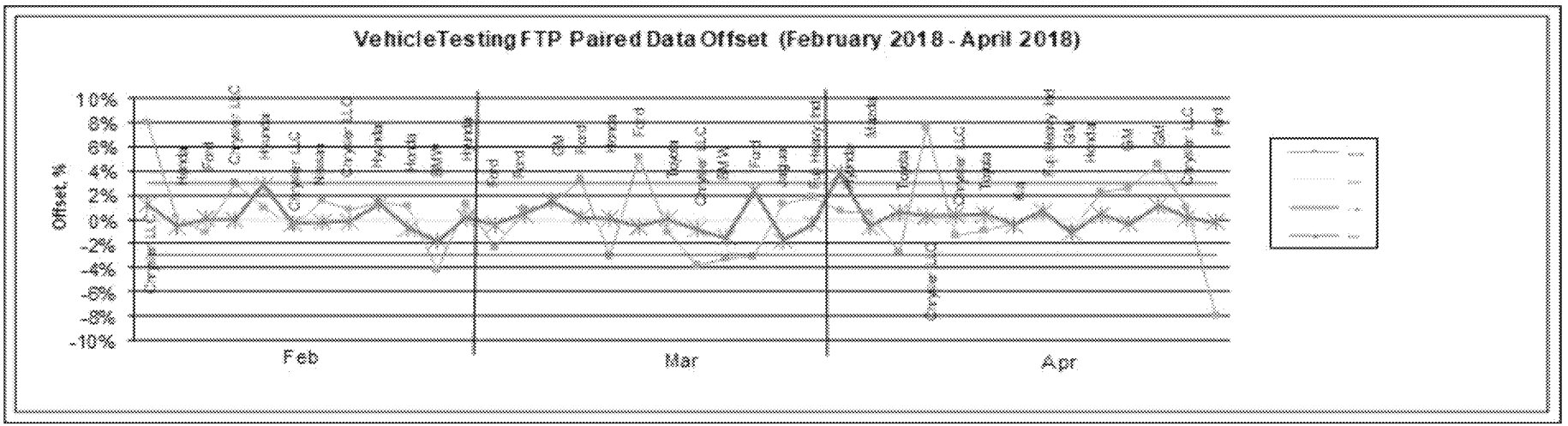
			units	Target	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
VEHICLE TESTING (Test Count)				**1300**												
	Compliance tests*		(count)													
		Cumulative	(count)	**800**												
		Cumulative percent	(%)	100												
	Development tests**		(count)													
		Cumulative	(count)	**500**												
		Cumulative percent	(%)	100												
	Acpt/Comp. Readiness Tests		(count)													
		Cumulative	(count)													
	Total Monthly Vehicle Tests		(count)													
		D001	(count)		19	30	20	36	71	1	11					
		D002	(count)		36	31	33	39	48	27	51					
		D005	(count)		18	50	37	20	22	84	71					
		D006	(count)		53	61	39	33	39	50	45					
		D329	(count)		39	37	35	37	48	30	25					
		CTTF	(count)		52	37	38	38	55	47	29					
		HTTF	(count)		22	55	35	27	44	30	40					
		HD Chassis	(count)		46	69	47	0	63	66	18					
		SHED Evap Tests	(count)		5	6	1	3	5	4	6					
	FTP Tests (>3% FE offset)		(count)		2	1	3	5	3	6	3					
		Rate (# /FTP Paired Data)	(%)	lower	22%	20%	30%	38%	25%	50%	21%					
	Repeat FTP Tests (>3%FE)***		(count)		0	1	0	2	2	0	1					
		Rate (# /FTP Paired Data)	(%)	lower	0%	14%	0%	13%	15%	0%	7%					

* Certification and In-use

** Regulatory, development, LOD and quality

*** # of Repeat Tests due to exceeding ±3% FE (applies to Certification Vehicles only)



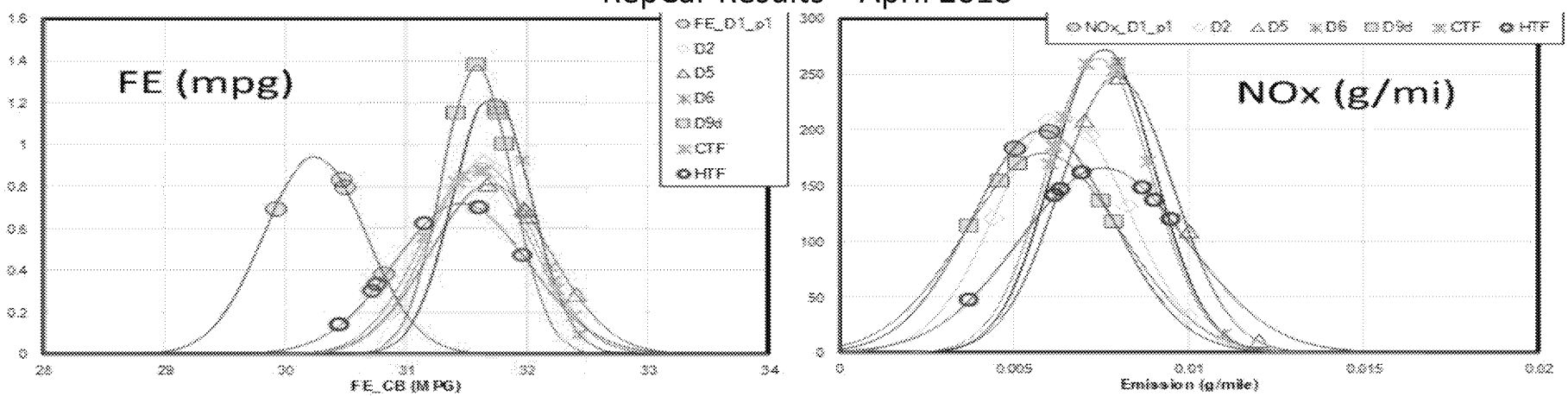


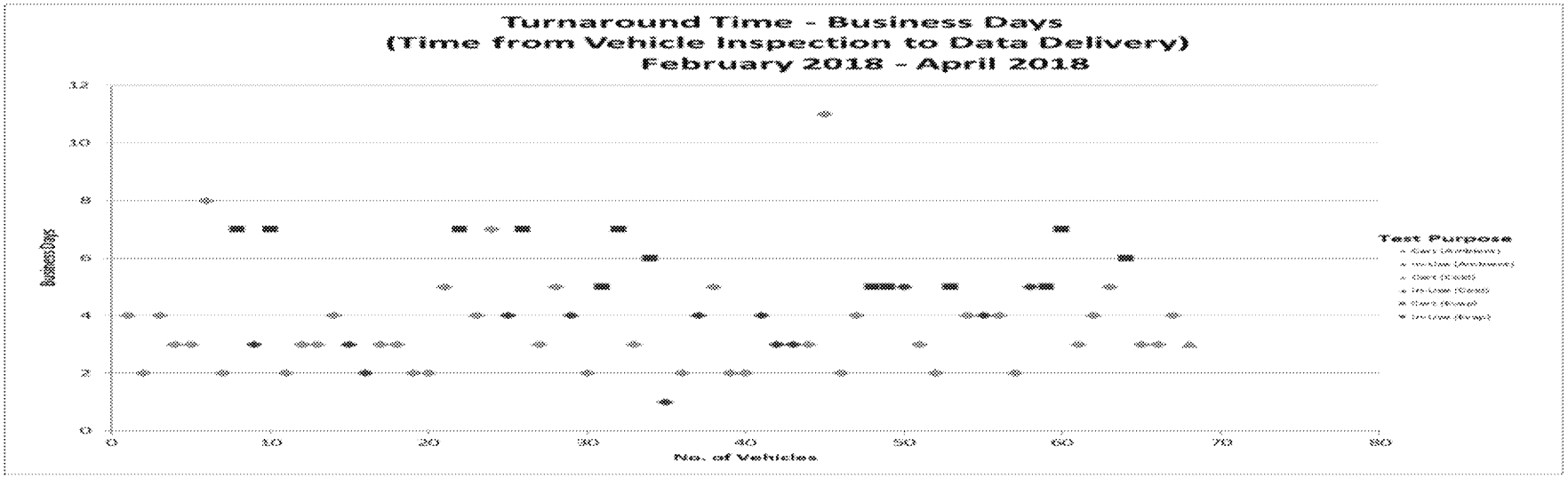
INTERLABORATORY COMPARISONS														
Vehicle Compliance		completed			completed									
Fuels COR	#Pass / Total	no samples			no samples			no samples						
Fuels consensus	#Pass / Total	4 / 4	4 / 4	4 / 4	4 / 4	4 / 4	4 / 4	4 / 4						
Fuels corporate	#Pass / Total	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6						

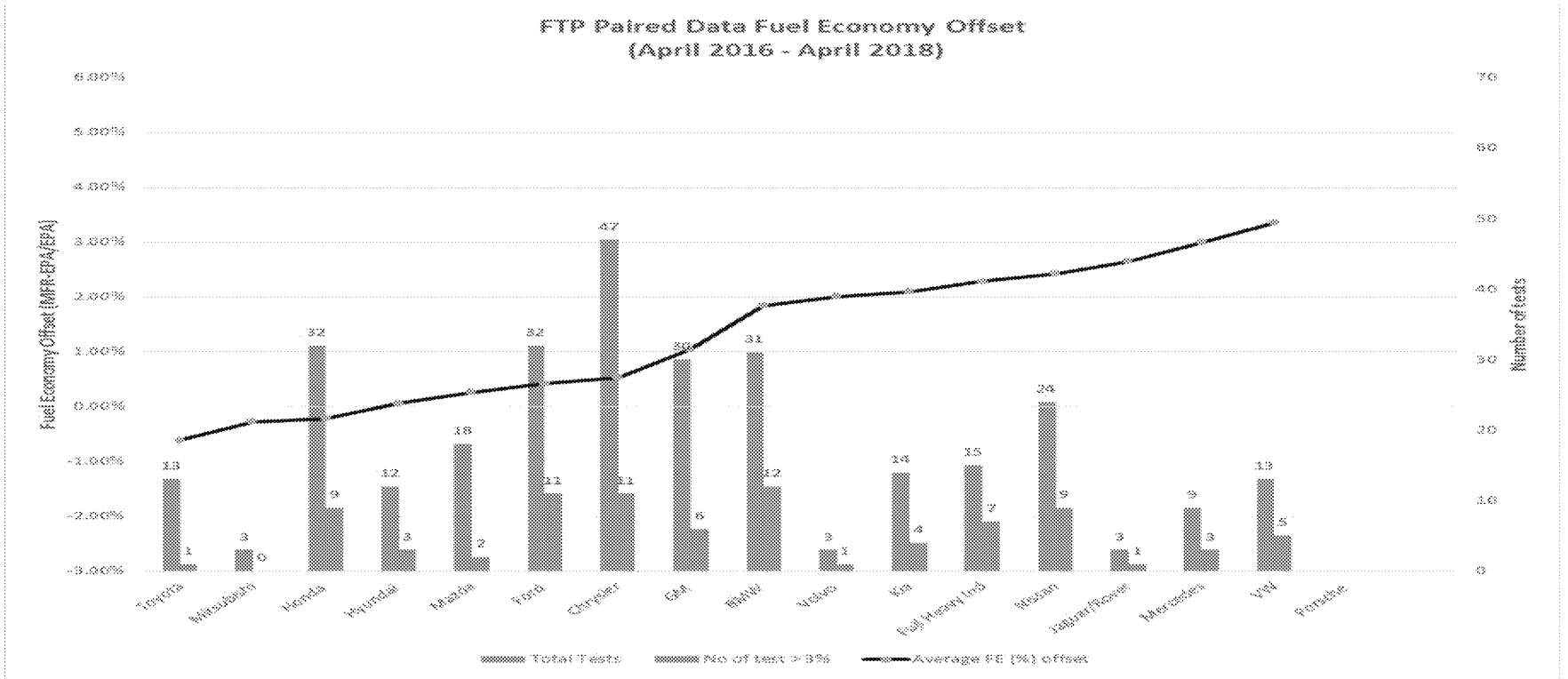
4th 2017 Quarter Vehicle - Diesel fuel vehicle study with N2O

1st 2018 Quarter Vehicle - Tier 2 Gasoline Hybrid vehicle study with PM and N2O

RepCar Results – April 2018

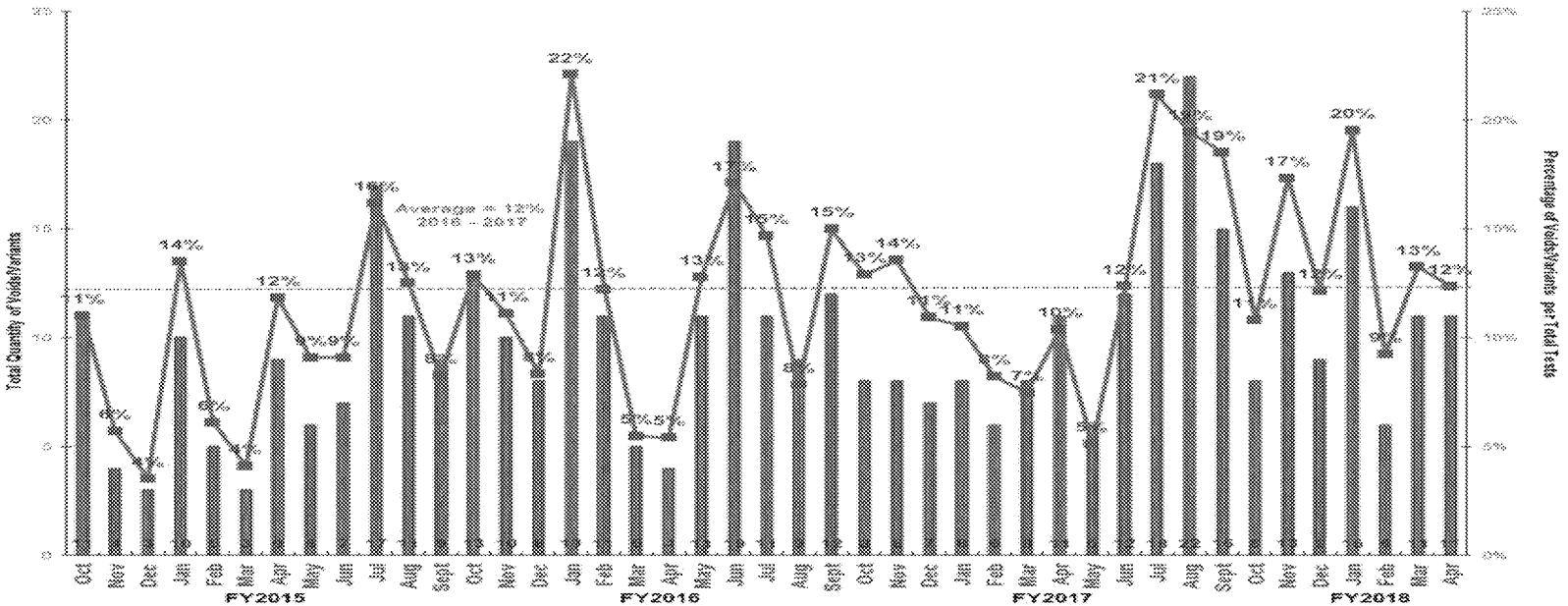



Turnaround Time - Business Days
(Time from Vehicle Inspection to Data Delivery)
February 2018 – April 2018
Business Days
No. of Vehicles
Test Purpose


FTP Paired Data Fuel Economy Offset
(April 2016 - April 2018)
Fuel Economy Offset (MPR-EPA/EPA)
Number of tests
Toyota
Mitsubishi
Honda
Hyundai
Mazda
Ford
Chrysler
GM
BMW
Volvo
Kia
Daf/Hino/Ud
Nissan
Jaguar/Rover
Mercedes
VW
Porsche
Total Tests
No of test > 3%
Average FE (%) offset

			units	Goal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
TEST PACKET AUDITS - COMPLIANCE VEHICLES																
	Quantity of Completed Compliance Test Packet Audits															
		Certification Vehicles	(count)		24	16	34	40	27	33	48					
		In-Use Vehicles	(count)		38	45	27	26	27	35	30					
		Certification Special	(count)		12	14	~~5~~ ~~11~~ 13	12	~~7~~ 11	15	11					
		Errors Found by CDRT	(count)		8	7	5	0	1	3	13					
		Errors Found by QST	(count)		1	3	8	2	~~2~~ 6	11	2					
VOID / VARIANT ANALYSIS - COMPLIANCE VEHICLES																
	Total Quantity - Void / Variant		(count)		8	~~12~~ 13	~~8~~ 9	~~12~~ 16	~~04~~ 6	11	11					
	Major Category Analysis															
		Personnel (100s)	(count)		1	2	2	1	~~1~~ 2	1	1					
		Equipment (200s, 700s)	(count)		6	~~7~~ 8	~~6~~ 7	~~04~~ 8	~~1~~ 2	6	9					
		Manufacturer (400s)	(count)		1	1	0	1	2	4	0					
		Facilities (300s)	(count)		0	1	0	5	0	0	0					
		Contractor (500s, 600s)	(count)		0	1	0	1	0	0	1					

VOID AND VARIANT ANALYSIS
TOTAL QUANTITY PER MONTH &
PERCENTAGE PER TOTAL TESTS PER MONTH



			units	Goal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
TEST PACKET AUDITS - COMPLIANCE ENGINES																
	Quantity of Completed Test Packet Audits															
		Heavy Duty Engine	(count)		10	8	20	7	0	0	0					
		Errors Found by QST	(count)		6	1	1	0	0	0	0					
VOID / VARIANT ANALYSIS - COMPLIANCE ENGINES																
	Total Quantity - Heavy Duty		(count)		1	3	~~1~~ 3	0	0	0	0					
	Total Quantity - Small Engine		(count)		0	1	0	0	0	0	0					

NVFEL OPERATIONS METRICS – TATD QUALITY

	units	Goal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
CONCERN IDENTIFICATION AND RESOLUTION ITEMS														
Corrective Actions														
New	(count)		1	12	1	0	0	1	1					
Open	(count)		3	14	13	9	9	5	6					
Closed	(count)		1	1	2	4	0	5	0					
Nonconforming Work Items														
New	(count)		2	0	1	1	0	0	0					
Open	(count)		2	2	3	4	3	3	2					
Closed	(count)		1	0	0	0	1	0	1					
Days Open Category														
Average Days Open	(count)		26	22	38	58	81	100	106					
Median Days Open	(count)		19	16	37	60	80	102	121					
New 0-14 Days	(count)		3	12	2	1	0	1	1					
3 Months 14-90 Days	(count)		2	4	14	11	9	0	1					
6 Months 90-180 Days	(count)		0	0	0	1	3	7	6					
Long Term > 180 Days	(count)		0	0	0	0	0	0	0					
Opportunities for Improvement / Customer Feedback / Preventive Action														
New	(count)		0	16	8	0	0	1	1					
Open	(count)		5	20	26	18	12	9	7					
Closed	(count)		0	1	2	8	6	4	3					
Long Term > 180 Days	(count)		0	0	1	1	0	0	0					
Total >180 Days	(count)	0	0	0	0	1	1	0	0	0				
QUALITY MANAGEMENT SYSTEM														
Documentation - Scheduled 18 Month Reviews (QSP, WI, TI, PD, AM)														
Approved & Released	(count)		453	454	454	453	452	458	455					
Reviewed & Approved	(count)		13	26	26	36	50	44	36					
Past Review Date	(count)		81	73	81	80	43	37	31					
Past Due Percentage		≤ 5%	18%	16%	18%	18%	10%	8%	7%					
STAFF OBSERVATION REVIEWS														
Quantity of Observations	(count)	6	5	2	4	5	3	7	10					
Category Analysis														
Center Director Request	(count)		0	1	3	1	0	0	0					
Process Revision	(count)		2	0	0	2	1	1	8					
New Document	(count)		3	1	1	1	2	6	2					
Lab Concern/Quality Issu	(count)		0	0	0	0	0	0	0					
Random Selection	(count)		0	0	0	1	0	0	0					

NVFEL OPERATIONS METRICS – TATD QUALITY

			units	Goal	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ISO-17025 TEST METHOD VALIDATION STATUS																
	Overall % Completion:															
	CTTF - Diesel Ambient				97%	97%	97%	97%	97%	97%	97%					
	CTTF - Cold Diesel FTP				97%	97%	97%	97%	97%	97%	97%					
	HTTF - Gasoline Ambient				97%	97%	97%	97%	97%	97%	97%					
	HTTF - Diesel Ambient				97%	97%	97%	97%	97%	97%	97%					
	LD D329 - 1066 Upgrade				36%	49%	49%	49%	49%	51%	54%					
	HD03 - Mid Range Diesel				97%	97%	97%	97%	97%	97%	100%					
	Canister Load Station				--	--	91%	91%	91%	91%	91%					

ISO-17025 TEST METHOD VALIDATION TRACKING MATRIX

Process Phase Completion & Monthly Progress Indicator

Test Site - Scope	Equipment Integration & Configuration	Progress	Test Process Evaluation	Progress	Data Management Systems Integration	Progress	CFR Checklist	Progress	Testing Documentation	Progress	Data Validation	Progress	Uncertainty Assessment	Progress	Moved Forward / No Change / Delay / N/A / Complete — Comments:
CTTF - Diesel Ambient	5 of 5		8 of 8		7 of 7		5 of 5		10 of 11		2 of 2		1 of 1		
CTTF - Cold Diesel FTP	5 of 5		8 of 8		6 of 6		4 of 5		11 of 11		2 of 2		1 of 1		
HTTF - Gasoline Ambient	5 of 5		7 of 7		6 of 6		5 of 5		10 of 11		2 of 2		1 of 1		
HTTF - Diesel Ambient	5 of 5		7 of 7		6 of 6		5 of 5		10 of 11		2 of 2		1 of 1		
LD D329 - 1066 Upgrade	2 of 5		7 of 7		4 of 6		2 of 5		3 of 11		1 of 2		1 of 1		
HD03 - Mid Range Diesel	5 of 5		7 of 7		7 of 7		5 of 5		11 of 11		2 of 2		1 of 1		100% Complete
Canister Load Station	5 of 5		7 of 7		6 of 6		5 of 5		8 of 11		0 of 0		1 of 1		